



**Johnson  
Screens**

# Industrial Screens



**A brand of  
Aqseptence Group**



# Johnson Screens Industrial Products



## A History of Innovation

At Johnson Screens, the spirit of invention has been in our DNA ever since Edward E. Johnson invented the Vee-Wire. Our products and solutions are often invisible, but they're all around you changing millions of lives for the better in over 100 countries around the world.

It is our tradition to see beyond the status quo and empower our customers and employees to create a future where protecting lives and precious natural resources is priority. Whether in food and beverage, pulp and paper, mineral processing, or power generation facilities, Johnson Screens provides numerous solutions related to industrial processes, including solutions for water intake, separation of water and solids, and water treatment.

As an ISO certified company, each product is subject to a procedure of self-inspection by each operator throughout the manufacturing process. A final inspection guarantees delivery of a product that fully meets the user's specifications. Processes involving any aspect of liquid/fluid/solid separation, Johnson Screens has products and experience to help achieve maximum efficiency and effectiveness.

We support our customers on their journey to environmental sustainability with innovative separation and screening solutions. We recognize our customers' unique challenges on that journey, and back each of our precisely fabricated screening solutions with our skilled engineering team and tradition of excellent customer service.

## About Vee-Wire®

Johnson Screens' stainless steel Vee-Wire® filter elements for liquid/solid and gas/solid separation are known for great strength, a long service life, and a high level of adaptability.

Vee-Wire (otherwise known as "wedge wire") screens are made by welding our patented V-shaped wire onto various sizes and shapes of support rods. This process creates a slot that enlarges inwardly, creating a large open area and clog-resistant surface. Our continuous welding method meets the most demanding standards for ruggedness, durability, resistance to abrasion, consistency and slot openings.

At Johnson Screens, the spirit of invention has been in our DNA ever since Edward E. Johnson first created Vee-Wire in 1904. His invention has changed millions of lives in over 100 countries around the world, and we are proud to carry on this tradition.



# As-Run Cylindrical Screens

## As-Run Screens

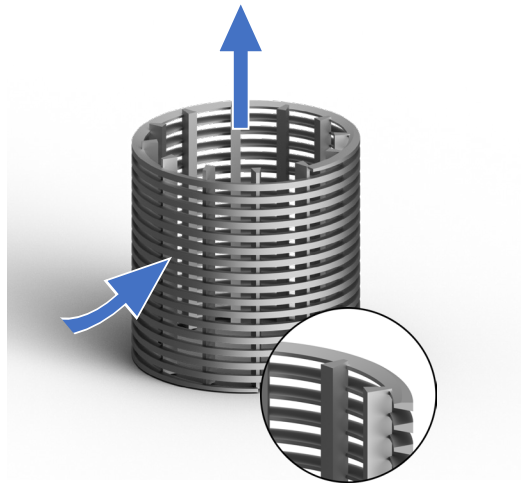
Our most common screen type.

### Benefit

- Economical
- Suitable for most applications
- Precision openings

### Product

- Typically filters from OUT to IN
- Most Johnson Screens solutions are built from a screen that starts in this arrangement



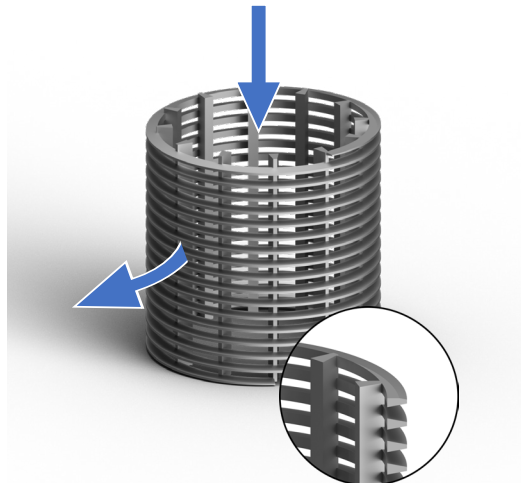
## Inverted Wire As-Run Screens

### Benefit

- Economical
- Suitable for most applications
- Precision openings

### Product

- Typically filters from IN to OUT



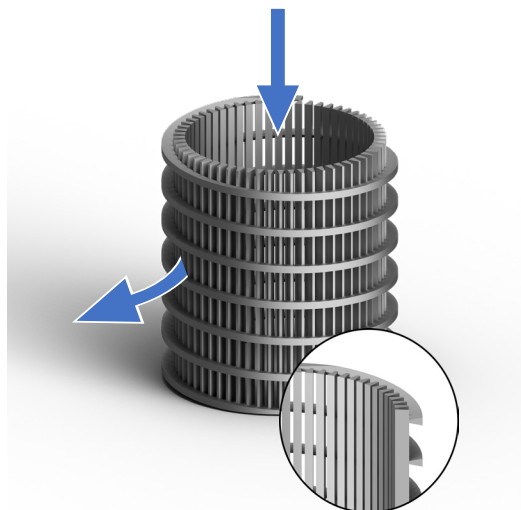
## Linear-Slot As-Run Screens

### Benefit

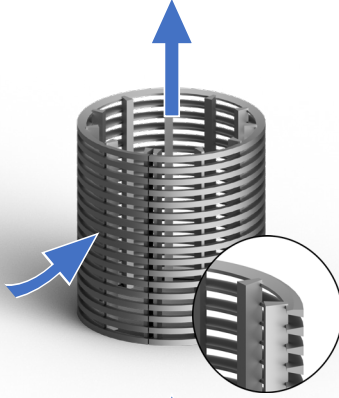
- Suitable for most applications
- Precision openings

### Product

- Typically filters from IN to OUT



# Rerolled Cylindrical Screens

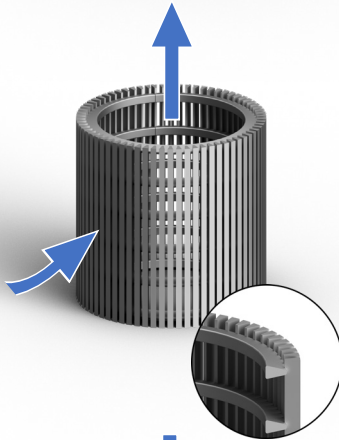


## Wire-Out Rerolled Screens

Wire-out rerolled screens are also known as External Circumferential Wire Screens.

### Product

- Typically filters from OUT to IN
- Can be built from multiple panels to achieve large sizes

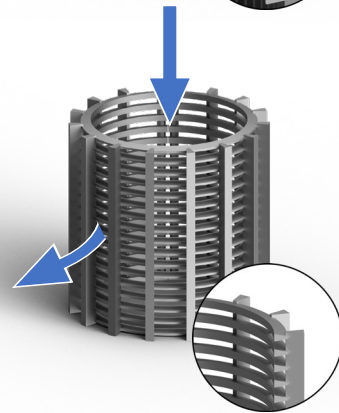


## Rod-In Rerolled Screens.

Rod-in rerolled screens are also known as External Axial Wire Screens.

### Product

- Typically filters OUT to IN
- Can be built from multiple panels to achieve large sizes

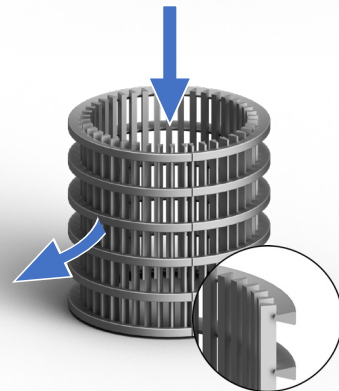


## Wire-In Rerolled Screens.

Wire-in rerolled screens are also known as Internal Circumferential Wire Screens.

### Product

- Typically filters IN to OUT
- Can be built from multiple panels to achieve large sizes



## Rod-Out Rerolled Screens.

Rod-out rerolled screens are also known as Internal Axial Wire Screens.

### Product

- Typically filters IN to OUT
- Can be built from multiple panels to achieve large sizes

All rerolled screens are created by splitting and flattening as-run screens. Additionally, they can be rolled to the diameter specified by the customer. All rerolled screens have a weld seam running the length of the cylinder.



# Industrial Screening Products

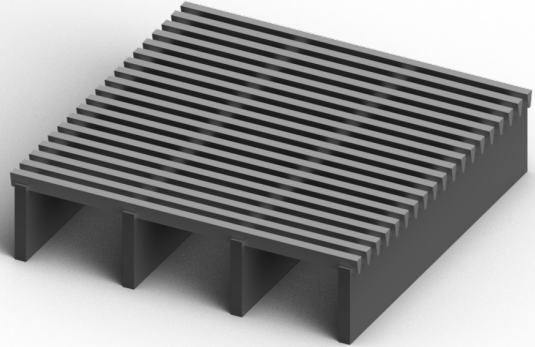
## Flat Screens

Johnson Screens offers a variety of flat screens for the malting and brewing industries. Vee-Wire screens are ideal for:

- Launder tubs
- Germination
- Kilning
- Ultra filtration
- Steeping
- Malt extraction

Used in the kilning, germination and drying phases of the malting process, Johnson Screens' malting bed screens are the ideal choice for malting floors and other screening needs in the malting process.

These screen panels can be designed to minimize "dead spots" in the malting floor over supports or other structures, to further improve the overall process. In between malting batches, the screens are very easy to clean, reducing contamination of the process



## Candle Filters

Candle filters are filter elements with the following qualities:

- Small diameter usually less than 1.97 in. (50 mm)
- Substantial length usually greater than 39.37 in. (1,000 mm)
- Very fine openings: 25 to 150 microns, according to the application
- Direct filtration
- Medium support (diatoms in filters)

The filtration capacity can be easily modified by varying the number of candle filters to obtain the required filter area.

### Cleaning

A stronger flow in the backward direction, known as backwash, cleans the candle filters effectively.

### Maintenance

Because the filter elements are particularly rigid and rugged, they can be disassembled without risk of damage to the filter surface.



## Screen Lateral Systems

These assemblies consist of a series of screen laterals connected to either a central header pipe or a hub. They are designed for effective media retention in a wide range of applications, including ion exchangers, clay and sand filtration applications and carbon towers.

### Features

- Lateral spacing, length, diameter and slot opening sizes are based on individual system need: slot size 0.002 in. (0.05 mm) and up in 0.0004 in. (0.01 mm) increments and diameter from 0.79 in. (20 mm) and up
- Assemblies are typically made with type 304SS, 316LSS or other exotic alloys are also available
- Connections of the laterals can be threaded fittings, couplings or flanges
- Optional internal drilled distributor pipe for a optimal backwash distribution cycle

### Benefits

- The design allows a uniform collection or distribution flow of a gas or liquid through treatment media without dead zones
- The system can accommodate a wide variety of vessel sizes and shapes with side, center, top or bottom inlet piping
- The assemblies can be designed to accommodate flow in any direction



## Laterals

There are two types of Johnson Screens' laterals - without drilled pipe or with distributor pipe. Both types are very effective collectors, however, for most effective backwash distribution, the screen design should include an internal distributor pipe. These distributor pipes are sized by Johnson Screens' design engineers so that backwash is evenly distributed throughout the system.





## Nozzles

Nozzles are used in liquid/solid or gas/solid separation. Their design and quantity will vary depending on application and customer-flow requirements. Nozzles allow a more effective use of the treatment media.

### Features

- Standard diameter: 1.96 in. (50 mm)
- Typical slot opening ranging from 0.007 in. to 0.019 in. (0.2 mm to 0.5 mm)
- Threaded end fittings or "L" bolts
- Primarily made of stainless steel; however, special spherical nozzles made from ABS or Kynar® are also available
- Custom sizes and materials also available



Standard Nozzle



Hydrosphere®

## Hydrosphere® Specs

**Material:** ABS plastic or PVDF

**Fitting:** 3/4" NPT male nipple

**Slot Size:** 0.008" (0.2 mm)

**Screen Open Area:** 0.9 in<sup>2</sup> (5.8 cm<sup>2</sup>)

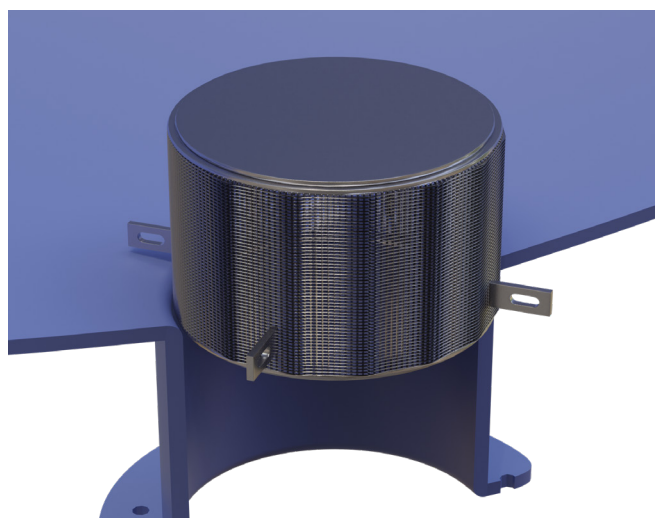
**Collection Flow:** 3-5 GPM (11-19 LPM)

**Backwash Flow:** 20-25 GPM (75-95 LPM)

**Overall Height:** 3.5 in (89 mm)

**Diameter at Flange:** 2.9 in (74 mm)

Standard Nozzle Specifications					
<b>Type 316L Stainless Steel</b>	.007" Slot	75N	100N	75R	100R
<b>Fitting</b>	Size	3/4" NPT	1" NPT	3/4" (19 mm)	1" (25 mm)
	Type	Thread	Thread	Ring	Ring
<b>Screen Diameter</b>	2" (50 mm)				
<b>Screen Length</b>	1 9/16" (40 mm)				
<b>Overall Length</b>	3 1/8" (80 mm)		2 1/8" (54 mm)		
<b>Spacing</b>	Optimum	6" (152 mm)			
	Maximum	11" (279 mm)			
<b>Suggested Maximum Collection Flow Per Nozzle</b>	4 GPM (15 LPM)				
<b>Suggested Maximum Backwash Flow Per Nozzle</b>		6 1/2 GPM (25 LPM)	11 1/2 GPM (44 LPM)	6 GPM (23 LPM)	10 1/5 GPM (40 LPM)
<b>Collapse Strength</b>	300 PSI (2070 kPa)				
<b>Burst Pressure</b>	200 PSI (1380 kPa)				
<b>Part Number</b>		254836	254842	254837	254852



## Outlet Baskets

A large range of industries use cartridges and baskets. Rugged, precise and easy to clean, these filter elements are suitable for all industrial processes.

Johnson Screens outlet baskets can be used for both conventional filtration (outside-in) and reverse filtration (inside-out). The use of extremely fine wire maximizes the open area. This process is even more effective for slots smaller than 100 microns.

The following types of fittings can be welded to allow incorporation of cartridges into any process:

- Collars
- Flanges
- BSP or NPT threaded end fittings
- Machined rings for fittings with O-rings or flat baskets
- Other fittings

## Radial Spider Lateral System

Lateral distributors and collectors are vessel internals used in the processing of fluids across a variety of applications. The patent-pending design for the Spider Lateral builds on decades of success of other Johnson Screens header lateral systems and introduces angled arms that more closely match the shape of the vessel head than prior lateral assemblies.

The distributor and collector pipes are designed by Johnson Screens engineers with a unique pipe hole pattern for every project, backed by Computational Fluid Dynamics (CFD) Analysis. The pipes are engineered to maximize usable volume while ensuring an even fluid distribution across the media beds and minimizing the pressure drop of the assemblies.

The Spider Lateral reflects Johnson Screens' commitment to meeting the unique challenges and specifications of every customer and project. Our products are fabricated to withstand highly corrosive environments from a range of materials including 304, 316L, 2205 Duplex, 2507 Super Duplex, C276 Hastelloy®, Inconel® 625, and more. With our industrial knowledge and engineering expertise, the Spider Lateral is an optimized solution for every application.





# Radial Spider Lateral System

## Applications

- Direct Lithium Extraction (DLE)
- Absorption/Desorption
- Ion Exchange
- Granular Activated Carbon (GAC) Vessels

## Benefits

- Utilizes more interior volume than other vessel internal options
- Process flow rate can be increased due to increased media utilization
- Less fluid is wasted filling the unused head region
- Vessel size and quantity can be reduced while maintaining capacity and output, resulting in CapEx and OpEx savings
- Uses custom internal flow modifiers for efficient distribution w/ low headloss
- Suitable for new and retrofitted vessels

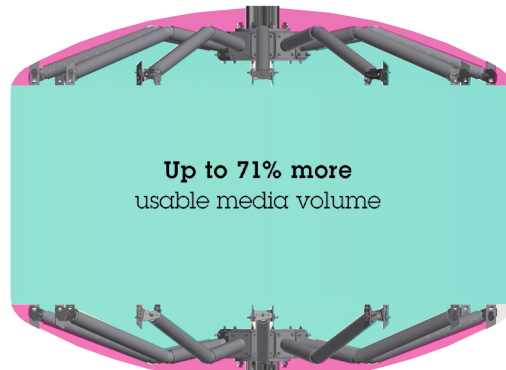
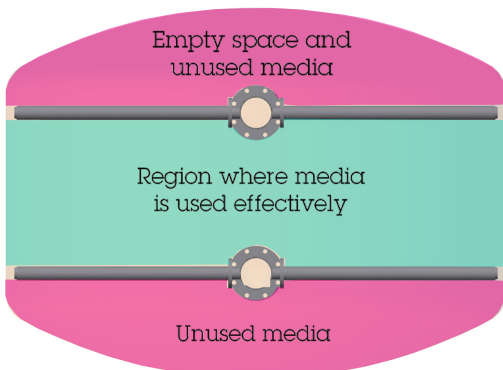
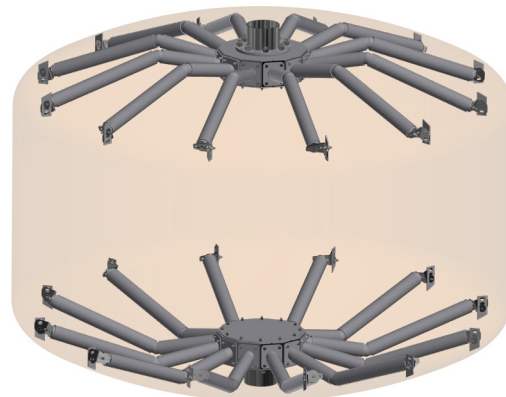
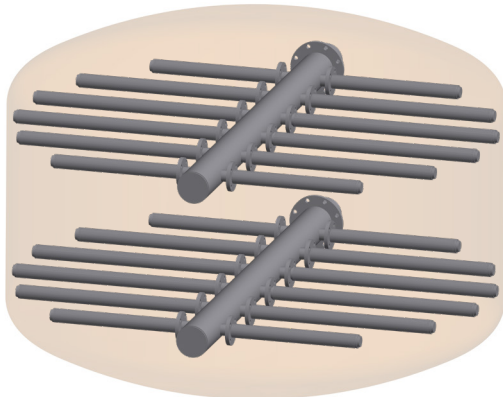
## Features

- Can be installed at the top and bottom of the vessel and work as collectors and distributors
- Custom lateral shape is used to closely follow the shape of the head without making contact
- The Vee-Wire screens surround a perforated pipe providing strength and a controlled distribution of fluid
- The screen slot (opening) size can be as small as 0.001" (25 microns)
- The laterals easily bolt into place, requiring no welding for installation
- Uses custom internal flow modifiers for efficient distribution with low headloss
- Manufactured using a range of materials that can withstand highly corrosive environments

**Header Lateral Assembly (Traditional)**

vs.

**Spider Lateral Assembly (New)**



Regions where media is not used effectively

Regions where media is used effectively

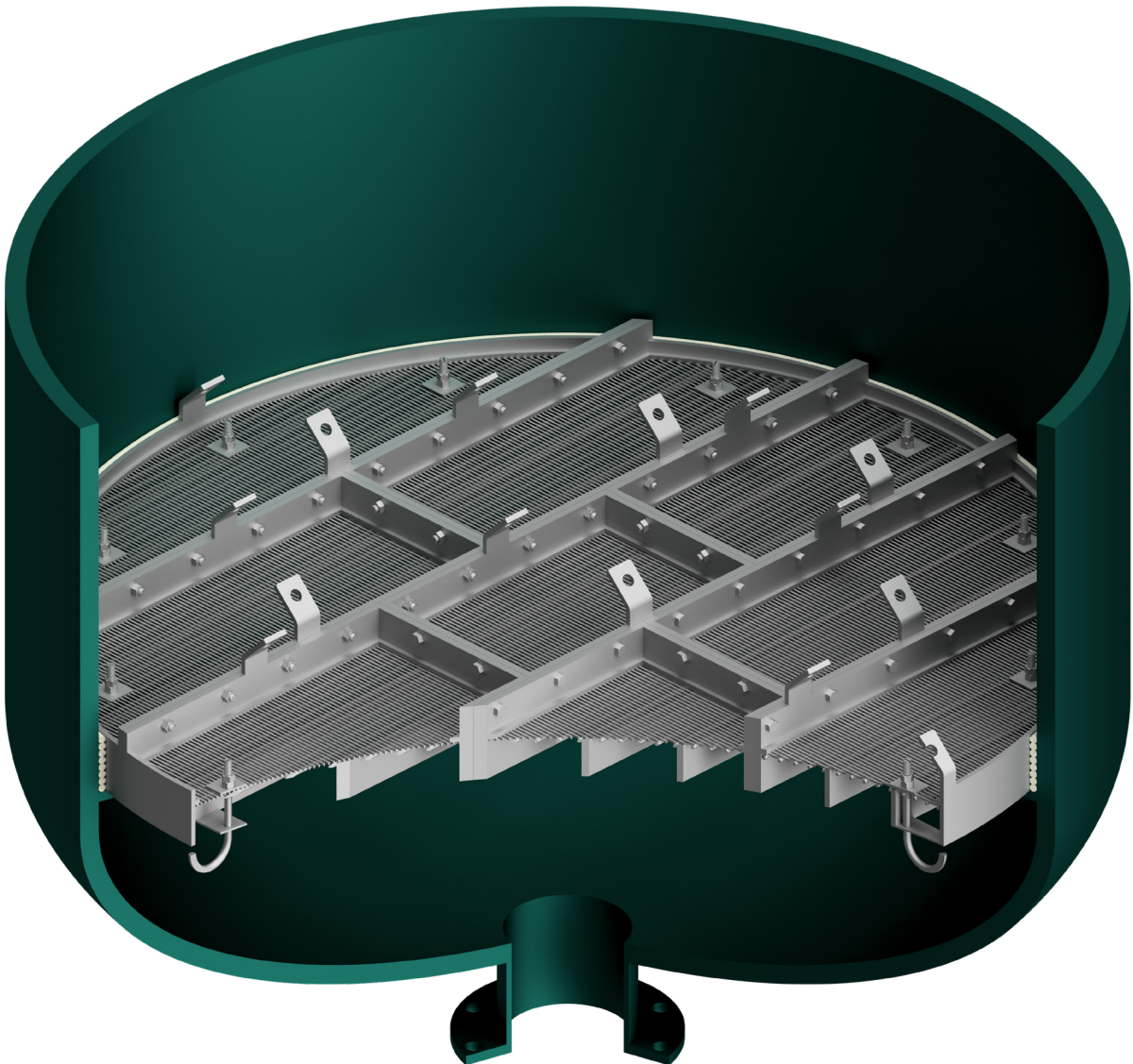
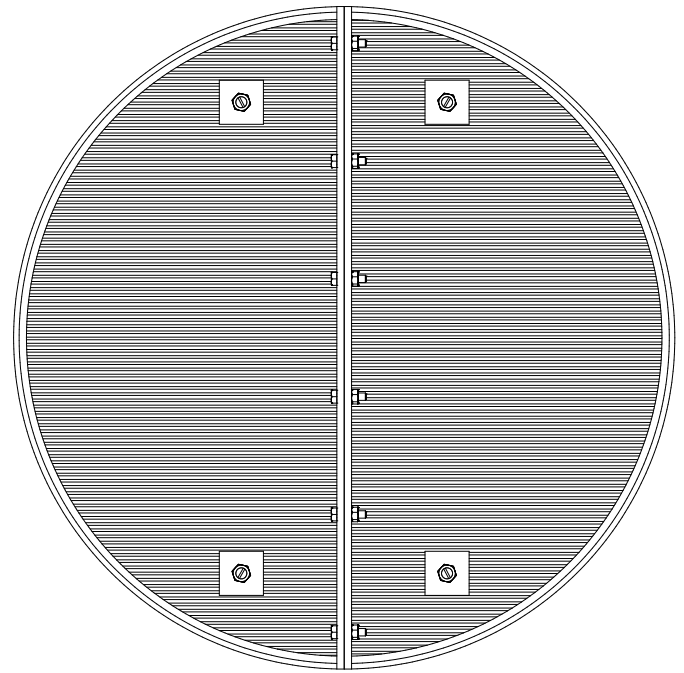
## Support Grids

The support grid system is available in a variety of framing options and designs — as a one-piece construction or in multiple sections for onsite assembly and ease of retrofitting through existing manways.

Support grids can be made into a variety of shapes. Our designs vary to accommodate different loads, temperatures, and custom specifications. Johnson Screens support grids can be fitted with manways, lifting lugs, thermowell guides and catalyst pump tubes.

In horizontal vessels, the screen is placed below the center line and extends the full length of the vessel. In vertical vessels, the support grid is placed just past the tangent line above the vessel head.

Depending on vessel size, the screen may span the entire distance or rest on one or more support beams. As with circular grids for vertical vessels, the screen is often made in bolted sections to facilitate installation.





## A Tried and True Innovation

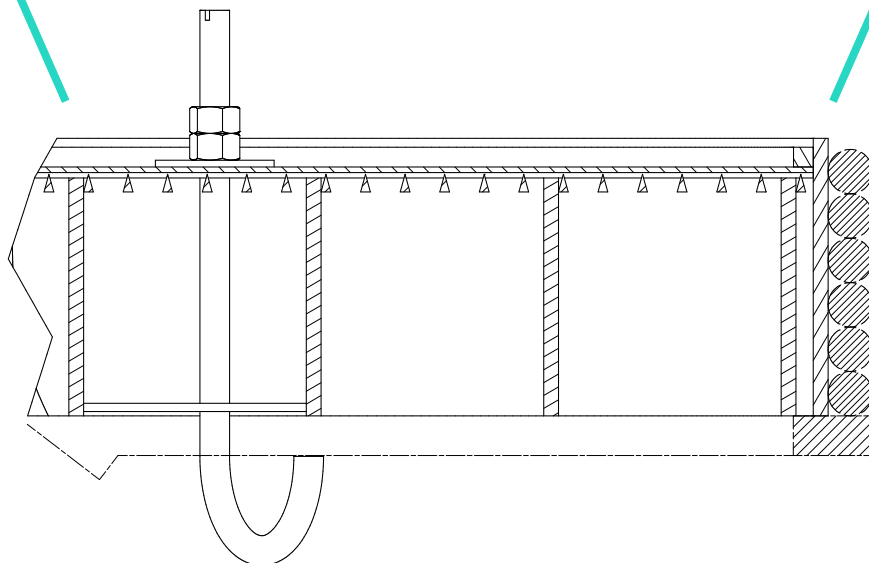
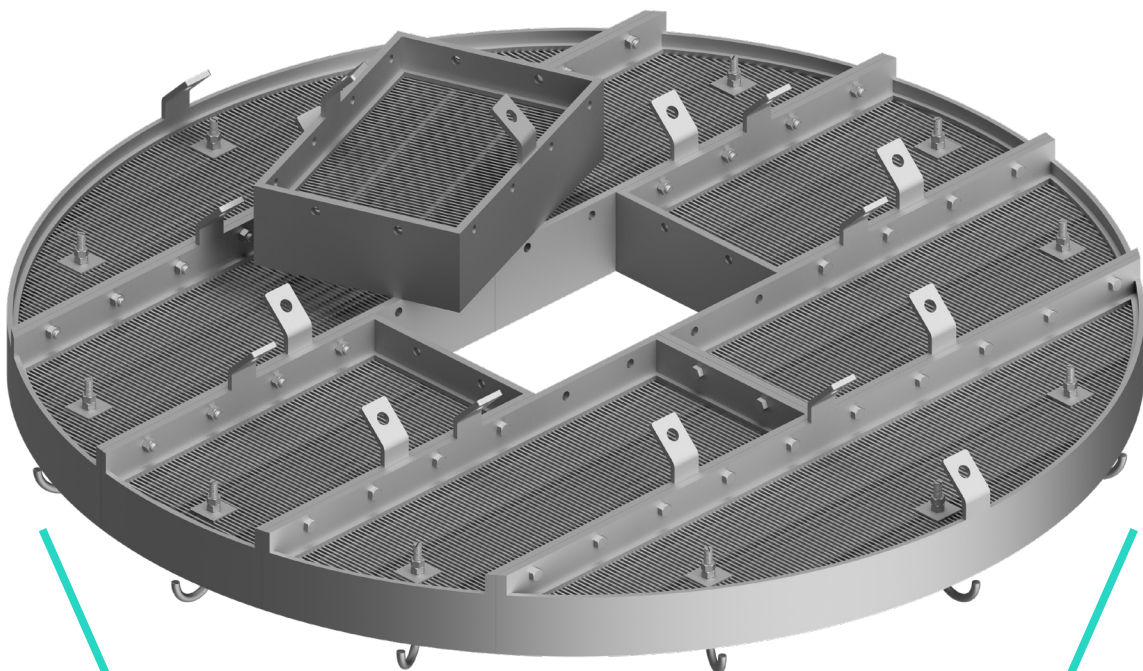
Johnson Screens provides industry-leading technology for a number of chemical and energy processing industries. No matter what obstacles are present in a given vessel, we can manufacture grids that accommodate these design features to ensure fit.

### Features

- Slot size can be designed for direct media retention
- Grids can be supported with support beams, rope packing, bolting and all necessary accessories

### Benefits

- Self-supporting structure resists collapse and buckling
- More effective open area than grids using wire mesh or grating
- Smooth surface of the screens reduces abrasion of media





## Shaped Support Grid (SSG)

Johnson Screens' Shaped Support Grid (SSG) is designed to be installed into the bottom head of vessels, allowing for better liquid and gas flow, bed utilization, distribution and an overall more efficient process.

With traditional flat surface grids designs, the entire volume of the head is a dead area, with no reaction or drying adsorption occurring. The SSG lies directly on the bottom head surface, allowing for the entire volume to be filled with media. Increased bed volume allows for the conversion of existing vessels to achieve higher process capacity.

## Vee-Wire Scallops

Vee-Wire® scallops are stronger, having a robust catalyst retention surface, making them ideally suited for tall radial flow applications.

### Features and Benefits

- Ideal for new applications or upgrading existing systems
- No modifications are required inside the reactor
- Increased open area
- Resistance to increase in pressure drop
- Significantly reduced catalyst damage from fewer expander rings
- Minimal catalyst fines generation and resistance to plugging
- Lower cleaning costs from unplugged retention surfaces
- The mechanical strength of the Vee-Wire scallops is designed to meet the specific needs of the unit
- The vertical strength of the scallop is increased while maintaining flexibility in the radial direction
- Simple reinforcement of the centerpipe provides a matched strength set of internals for more reliable operation
- Reduced turnaround costs from fewer scallop repairs
- Easily switched out during a turnaround in the same time frame needed to clean and repair perforated scallops



## Resin Traps/Inline Strainer

A resin trap is a safety device used on the overflow lines of ion exchange units, high-purity water systems and activated carbon and media filters.

In many systems, a valve failure can allow media to escape from the treatment vessel. Not only is the loss of expensive media significant, but damage can easily occur to downstream pumping equipment.

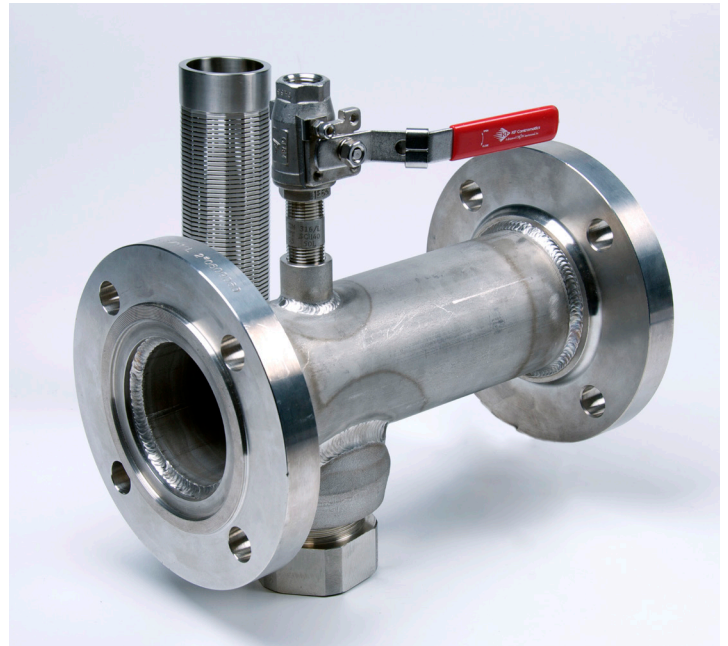
Resin traps, placed inline, provide positive protection. The traps can be designed to capture media particles of any size

### Features

- Continuous slot design, allowing traps to capture media particles of any size, providing sufficient open area to let process flow move smoothly
- Stainless steel construction (other alloys can be used, depending on pressure and temperature)
- Various options for sizes, shapes and connections, depending on process flow characteristics
- Designed for full system pressure

### Benefits

- Prevents expensive resin/media loss into piping distribution system
- Protects downstream pumping equipment
- Visibility of minor resin/media losses in prevention of major equipment failure







## Gravity Screens

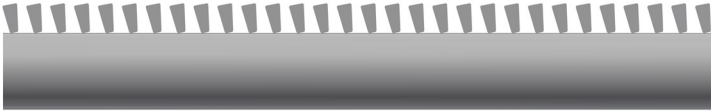
Johnson Screens' gravity screen is used for coarse separations ahead of additional processing systems.

Gravity screens use a Vee-Wire dewatering screen to retain the solids while allowing effluent to run through the system. The slurry is gravity fed to the head box and then flows to the screen. The solids retained from the screen are gathered for disposal or reuse.

The easy-to-install gravity screen features low operating and maintenance costs and can be designed according to client specifications.

### Tilt

The "tilting" of the profile wire angle, typically 5° to 10°, enhances the dewatering and separation of material on cross flow screening applications



## Screw Press Screens

For dewatering using a screw press, we can provide a screen designed to meet your exact specifications. Johnson Screens' high-strength design can withstand the rugged operation, while providing an accurate slot width and maximizing open area to maximize dewatering. For use in numerous industrial designs. Abrasion resistant options are available.

### Features

- Accurate slot width
- Custom designed to fit any application

### Benefits

- High strength design
- High open area

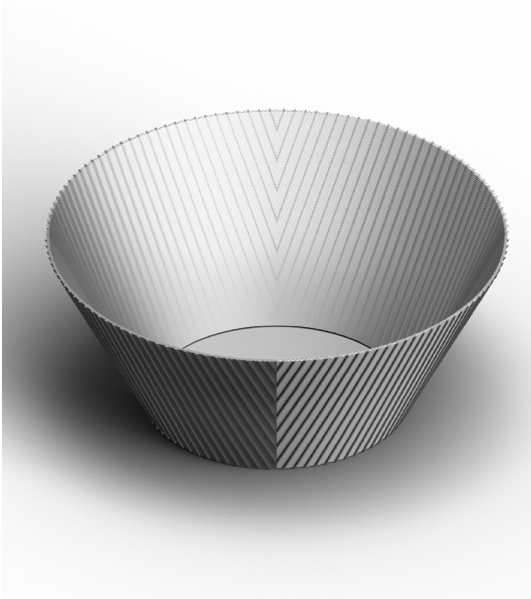


## Centrifuge Baskets

Our centrifuge baskets combine design innovation, fit-for-purpose material, and world-class Vee-Wire® to deliver beneficiation process improvements and longer product life cycle solutions for mining, pulp, and paper, and food and beverage applications.

### Features

- Increased fiber dewatering compared to nickel screens
- Extended wear life
- Designed and manufactured to each centrifuge design
- Variable slot openings from 20 µm and up
- Fine Vee-Wire construction prevents clogging
- Capable of withstanding high backwash pressures
- Long lasting, fewer change-outs
- High resistance to abrasion
- Fast and easy installation
- Low maintenance, easy to clean
- Replaces electroformed and laser screens



# PVC Inline Mixer

Johnson Screens' NSF 61 approved inline mixer utilizes a unique internal design, which uses ordinary line pressure to create high levels of turbulence, enhancing the mixing of fluid additives with the product stream. With no moving parts, the inline mixer is virtually maintenance free and installs quickly and easily with no special tools or additional components. These inline mixers are used in a wide variety of processes, such as chemical blending, pH control, water treatment and chlorine mixing.

## Standard features of the inline mixer include:

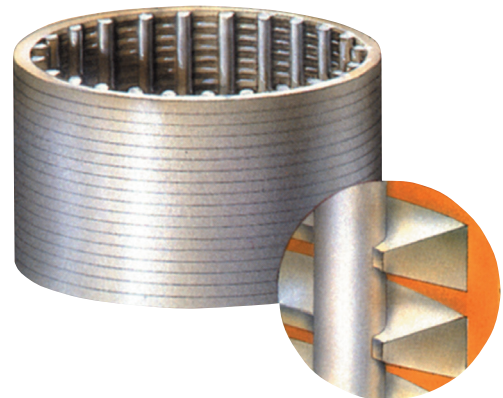
- PVC construction aids in chemical compatibility
- Clear PVC sight tube allows easy viewing of the mixing process
- Standard 1 in. male NPT threads on the inlet and outlet ports
- Standard ½ in. female NPT threads on the injection port
- Improved mixing performance
- Reduced energy consumption
- Larger wrench flats
- Reduced backpressure during operation
- Handles higher flow rates up to 30 GPM



# PVC Vee-Wire

Commonly used in shallow wells, PVC Vee-Wire screens present higher open area screen available in PVC. PVC Vee-Wire screens resist corrosion from aggressive waters and are ideal for many environmental applications. PVC screens are furnished with F480 flush threads or plain ends for connecting to Johnson Screens PVC fittings.

1. Clear ID's are minimum inside diameters
2. Tensile values are based on support rod area, other values are based on flush-thread test values
3. Collapse strengths are calculated values - no safety factor included
4. Hang weights are the maximum combined weight of riser and screen to be hung from the top screen joint
5. All strength properties are based on 73° F
6. Alternate construction for environmental applications



\*Alternate construction for environmental applications

All Johnson Screens Flush Threaded PVC pipe and screen products are manufactured from plastic of Type 1, Grade 1, PVC compound with a cell classification of 12454-B per ASTM D1784. Pipe materials are NSF approved for potable water and are in strict compliance with ASTM D1785. Screens are furnished with F480 flush threads or plain ends for connecting to Johnson Screens PVC fittings.

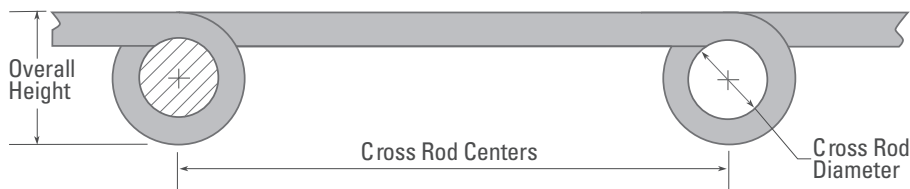
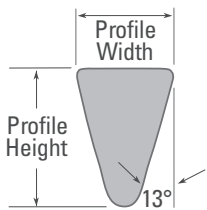
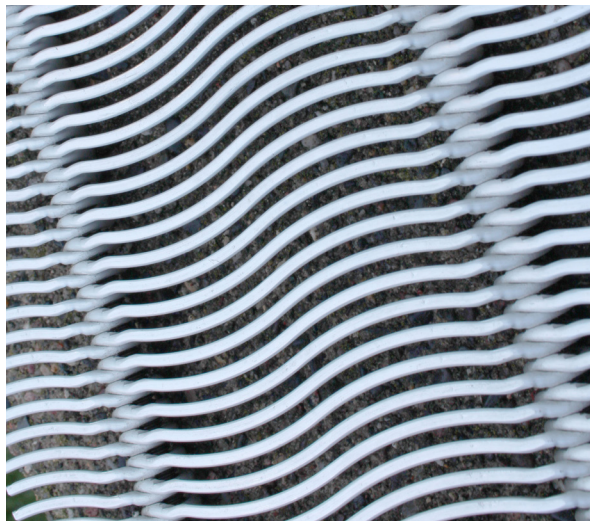
# Loop Profile Wire Screens

Loop Profile wire screens find uses in a wide variety of applications. Loop construction eliminates a welding requirement to join the rod and wire, and greatly increases the strength and durability of the screen.

Johnson Screens' proprietary loop wire manufacturing process allows for a great degree of flexibility in producing various profile shapes, openings and support member

configurations. Standard specifications for Loop Profile wire screens are illustrated. Additional specifications are available by contacting your Wedge Wire sales engineers.

Flexible manufacturing gives Wedge Wire the capability to manufacture screens utilizing virtually any metal, from basic carbon steels to high tech alloys.



## Specifications for Profile "D"

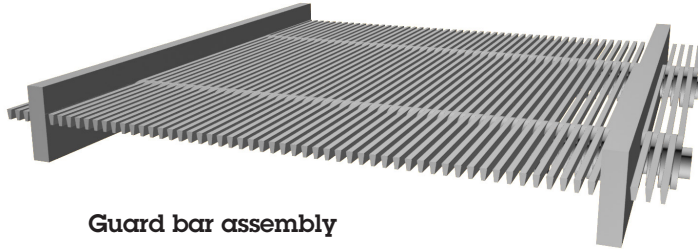
Wire Number	Standard Openings (in.)	Cross Rod Diameter (in.)	Cross Rod Centers (in.)	Profile*	
				Width (in.)	Height (in.)
70	.003 - .040	0.25	2	0.06	0.085
100	.005 - .060	0.3125, 0.375	2.75	0.086	0.125
132	.010 - .080	0.3125, 0.375, 0.5	2.75	0.109	0.156
156	.020 - .100	0.375, 0.5	2.75	0.135	0.188
187	.030 - .120	0.375, 0.5	2.75	0.172	0.219
217	.040 - .160	0.375, 0.5	2.75, 4	0.188	0.266
250	.060 - .200	0.5	2.75, 4	0.219	0.281



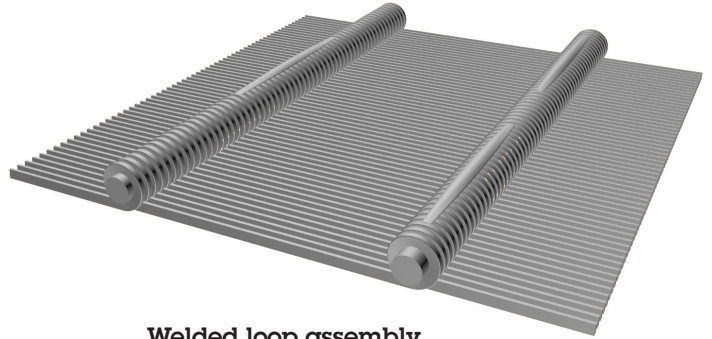
# Looped Wire Assembly and Framing Options

Comprehensive fabrication capabilities allow Johnson Screens to supply a wide range of customized framing and assembly options designed to meet individual customer needs.

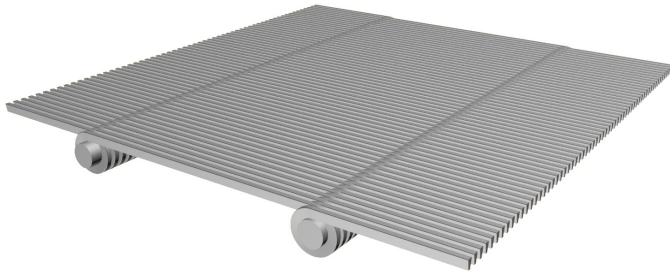
Johnson Screens' technical department and engineering staff are available to help create the total profile wire system which is best suited to solve your specific application requirements.



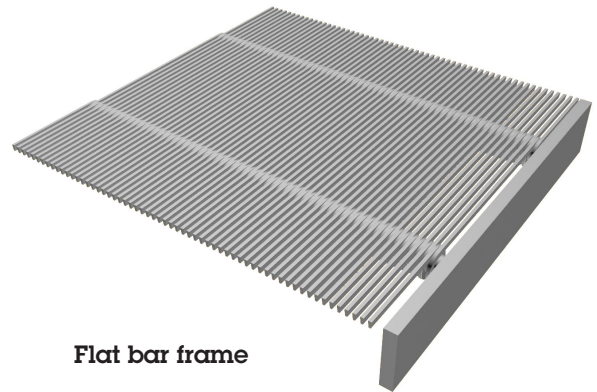
**Guard bar assembly**



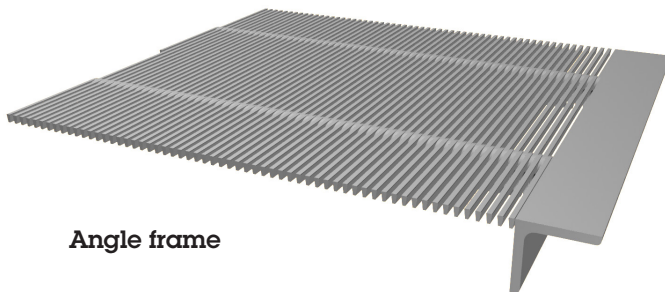
**Welded loop assembly**



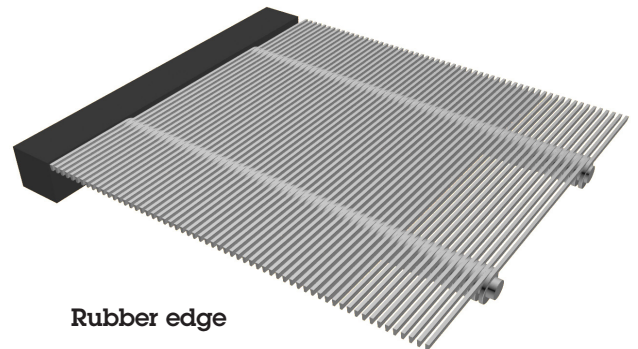
**Mat section with no bushing**



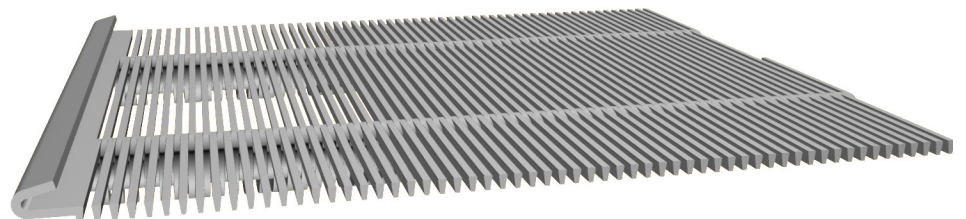
**Flat bar frame**



**Angle frame**



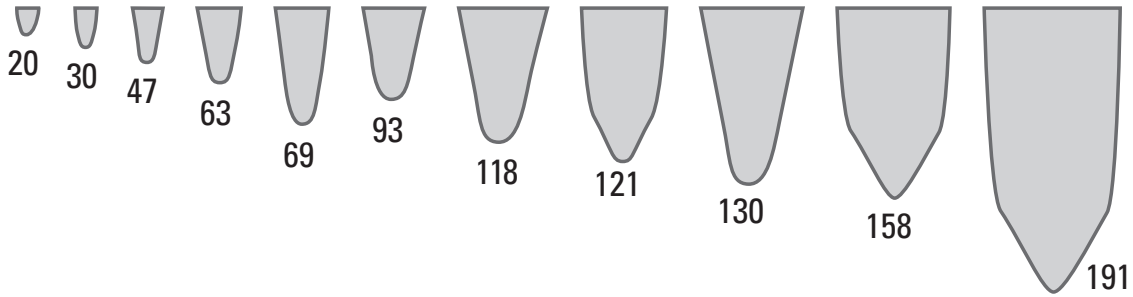
**Rubber edge**



**Hook Strip**

# Wire and Rod Information

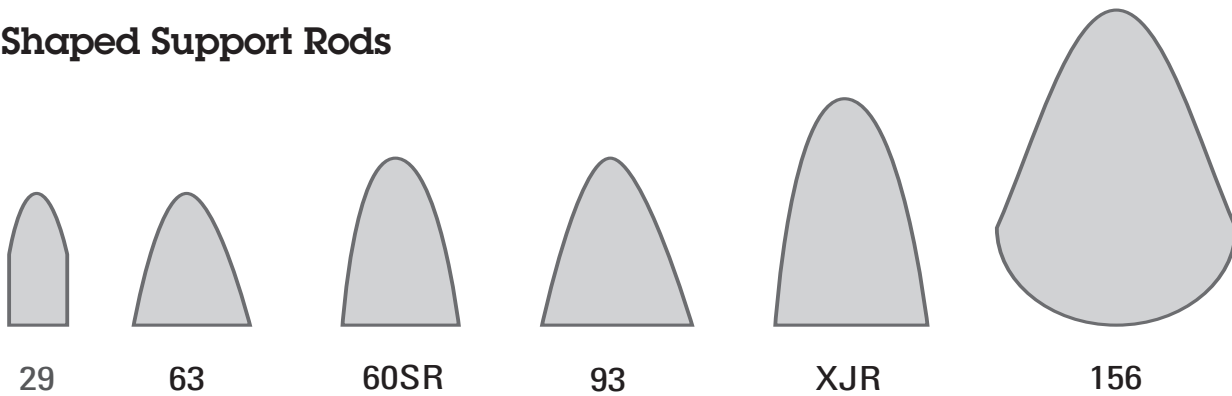
## Vee-Wire® Profiles - Most Commonly Used



$$\text{Open Area (\%)} = \frac{\text{Slot Size} \times 100}{\text{Slot Size} + \text{Wire Width}}$$

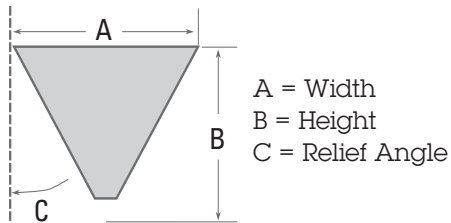
Name	Width		Height		Section Area		Relief Angle
	in.	mm	in.	mm	in <sup>2</sup>	mm <sup>2</sup>	
20	0.020	0.508	0.040	1.016	0.0005	0.323	11°
30	0.030	0.762	0.050	1.270	0.001	0.645	13°
47	0.047	1.194	0.088	2.235	0.003	1.935	10°
63	0.060	1.524	0.100	2.540	0.004	2.581	13°
69	0.071	1.803	0.177	4.496	0.010	6.452	7°
93	0.089	2.261	0.138	3.505	0.009	5.806	13°
118	0.116	2.946	0.185	4.699	0.015	9.677	13°
130	0.130	3.302	0.250	6.350	0.023	14.839	8°
191	0.195	4.953	0.363	9.220	0.055	35.484	5°

## Shaped Support Rods



Name	Width		Height		Section Area		Section Modulus (in. <sup>3</sup> x 10 <sup>-3</sup> )
	in.	mm	in.	mm	in.	mm	
29	0.029	0.737	0.102	2.591	0.003	0.076	0.037
63	0.060	1.524	0.100	2.540	0.004	2.581	0.050
93	0.089	2.261	0.138	3.505	0.009	5.806	0.150
XJR	0.089	2.261	0.189	4.801	0.013	0.330	0.298
60SR	0.060	1.524	0.120	3.048	0.006	0.152	0.077
156	0.151	3.835	0.217	5.512	0.022	0.559	0.600

## Tri-Wire Profiles

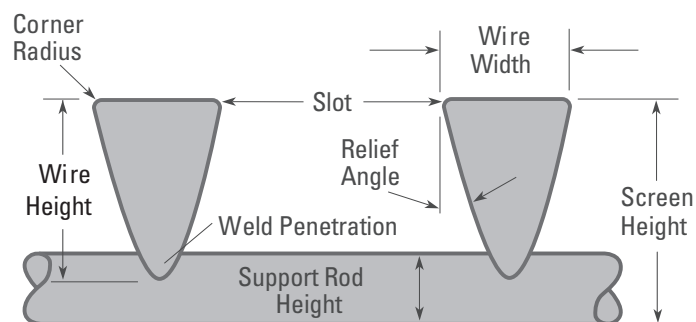


Wire Number	Width		Height		Relief Angle
	in.	mm	in.	mm	
93 TRI	0.093	2.388	0.070	1.956	30°
125 TRI	0.125	3.175	0.094	2.769	30°
188 TRI	0.188	4.775	0.141	4.369	30°
250 TRI	0.25	6.35	0.188	5.563	30°
500 TRI	0.50	12.7	0.469	11.913	30°

## Examples of Screen Open Area

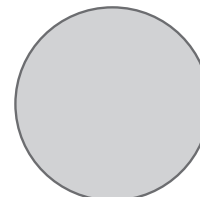
Wire No.	Percent of Open Area						Slot Opening Size (in.)
	20	30	40	50	60	70	
30	0.008	0.013	0.020	0.030	0.045	0.070	Slot Opening Size (in.)
47	0.012	0.020	0.031	0.047	0.071	0.110	
63	0.015	0.026	0.041	0.060	0.090	0.140	
69	0.018	0.030	0.047	0.071	0.107	0.166	
93	0.022	0.038	0.059	0.089	0.134	0.208	
118	0.029	0.050	0.077	0.116	0.174	0.271	
130	0.033	0.056	0.087	0.130	0.195	0.303	
158	0.040	0.068	0.105	0.158	0.237	0.369	
191	0.049	0.084	0.130	0.195	0.293	0.455	
250 TRI	0.063	0.107	0.167	0.250	0.375	0.583	
500 TRI	0.125	0.214	0.333	0.500	0.750	1.167	

## Standard Welded Construction



## Round and Strip Rods

- Round rods are available in diameters ranging from 0.125 to 0.500 in. (3.175 to 12.7 mm).
- Strip rods are available in widths ranging from 0.070 to 0.188 in. (1.778 to 4.775 mm) and heights ranging from 0.375 to 2.0 in. (9.525 to 50.8 mm).





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